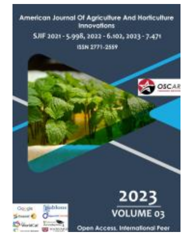
American Journal Of Agriculture And Horticulture Innovations
(ISSN – 2771-2559)
VOLUME 03 ISSUE 02 Pages: 13-19
SJIF IMPACT FACTOR (2021: 5. 705) (2022: 5. 705) (2023: 7. 471)
OCLC – 1290679216



Publisher: Oscar Publishing Services

Journal Website: https://theusajournals.com/index.php/ajahi

Research Article

TRANSPIRATION RATES OF WINTER WHEAT CULTIVARS UNDER SALINE CONDITIONS

Submission Date: February 18, 2023, Accepted Date: February 23, 2023,
Published Date: February 28, 2023
Crossref doi: https://doi.org/10.37547/ajahi/Volume03Issue02-03

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ABSTRACT

The article presents the data obtained on the study of the characteristics of the effect of soil salinity on the transpiration rate of winter wheat varieties. The rate of transpiration was determined at the tuber, flowering and milk-ripening stages of the cultivars. Based on the given results, it was noted that the value of the above indicator varies to different degrees in the section of varieties, depending on the soil salinity and the biological and various characteristics of the varieties.

KEYWORDS

Winter wheat varieties, salinity, transpiration, water exchange, salt tolerance.

INTRODUCTION

Globally observed stress factors -have a serious negative impact on living organisms, including the world of plants. As a result, the productivity indicators of plants and the harvest and its quality are decreasing. Deepening of scientific and research work aimed at reducing the negative effects of such stress factors and development of measures to save the lost crop, assessment and justification of the physiological aspects of the effects of adverse stress factors are considered as the most important tasks [1-3].

Studying the mechanisms of resistance of plants to salt stress and revealing it is one of the urgent theoretical and scientific problems in the world, by deepening scientific research in this field, creating methods of using exogenous and endogenous substances to increase the resistance of wheat to stress factors, wide use of the existing gene pool of crops in genetic-selection research and great attention is paid to wide application to agricultural production. The need for such research is explained by the fact that it requires the activation of various physiological and biochemical mechanisms to overcome the stress that occurs in plants under the influence of salinity [4-8].

Grain crops are one of the important technical crops that provide raw materials for various branches of production. Optimum factors aimed at maintaining the crop are required when growing products at the level of demand. Improving the agro-melioration condition of the irrigated lands of our republic, improving the Eco physiological and agro technical measures used in the prevention of soil salinization, identifying, creating and putting into practice the varieties of agricultural crops adapted to stress factors, the physiological and biochemical characteristics of wheat varieties that express the level of resistance and productivity in stressful conditions, and the adaptation of varieties Certain results were achieved in the evaluation and scientific justification of reactions [9-14].

Abiotic stressors have a strong negative effect on agricultural plants, reducing plant growth and productivity. Water scarcity, soil salinity, and high temperatures are among the main causes of declining crop yields and food supplies around the world. Therefore, the study of the effects of abiotic stressors on plants and the mechanisms of stress resistance is one of the main areas of plant physiology. Mechanisms of resistance to abiotic stress also include practical aspects such as reducing the harmful effects of stress in different ways or using native varieties adapted to combined stress as a source of genetic material [15].

Climate change inevitably leads to the deterioration of the ecological situation, which causes the salinization of fertile soils, resulting in a sharp decrease in the productivity of agricultural crops. Saline soils are common in many countries of the world. They cover about a quarter of the earth's surface, including half of all irrigated land, and the saline areas are expanding. In the arid climate, almost all irrigation water evaporates, and soil salinity is gradually increasing [16].

Abiotic stressors are a major impediment to agriculture, dramatically reducing plant growth and productivity worldwide. Future declines in agricultural crop yields will be exacerbated by global warming, increased pollution, and declining fertile land. The main challenge facing agriculture today and in the future is to increase food production for an ever-growing population in many regions of the world in a deteriorating environment. Minimizing exposure to various abiotic stressors is a common challenge [17].

The study of mechanisms of resistance to abiotic stress is one of the most active areas of research in plant physiology, taking into account its practical importance in agriculture. Various abiotic stresses caused by the environment are usually interrelated and often have an osmotic component that affects the homeostasis of plant cells. To cope with abiotic stress, plants activate a series of stress responses that are characteristic of sensitive and tolerant plants, because they use the same basic modifications [18].

Salinity is a major abiotic factor affecting crop productivity worldwide. Global warming is associated with more frequent, longer, and severe droughts in many regions of the world, as well as increased salinity in irrigated lands. About 20% of the world's irrigated

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land, which produces one-third of the world's food, is subject to secondary soil salinization. In addition, salt stress also induces ion stress and Na+ toxicity [19].

Selection for salt tolerance should be based on the growth of plants over a period of time since individual cultivars within the same self-pollinated species have almost genotypically the same homozygote. Short-term studies may show reduced growth rates; however, these reductions may be the same for tolerant and susceptible species within a cultivar. Only after a long time can tolerance or sensitivity be accurately measured in an individual plant, or the mechanisms that help specific plants to withstand NaCl conditions at different stages of growth can be identified [20].

Salinity is a global problem for agricultural production. Understanding Na+ sensitivity and transport in plants under salt stress will be useful for breeding salt-tolerant crop species. First of all, salt stress sensor representatives and the root meristem zone are proposed as tissues that store salt stress-sensing components. The importance of Na+ excretion and vacuolar Na+ sequestration in the general salt tolerance of plants is then highlighted. Finally, some aspects of plant salt stress tolerance, including the concentration of Na+ in the cytosol and the role of Na+ as a nutrient, have been discussed [21].

Soil salinization has become one of the major environmental problems globally and is expected to worsen due to projected climate change. Arid and semi-arid agricultural areas are particularly sensitive to the effects of climate change on increased soil salinity [22].

Saline soils are common in many countries of the world. They occupy a quarter of the land surface, including half of the irrigated land, and the area of saline areas is gradually expanding. In arid climates, almost all irrigation water evaporates and soil salinity gradually increases. At present, more than 50-60 per cent of the irrigated lands are salinized and prone to salinization. The salts of saline soils of Uzbekistan are very different in terms of quality. Chloride, sulfate-chloride, chloride-sulfate, sulfate, and carbonate salinity types are found. Among them, chloride salinity is the most toxic [23-25].

METHODOLOGY

Winter wheat during experiments as an object of research Grom, Pervitsa, Starshina, Alekseevich, Krasnodarskaya-99, Vassa, Asr and Antonina varieties were used. In recent years, these varieties have been planted in large areas across the country.

Experiments were conducted in areas belonging to meadow-alluvial soil type with moderate to strong chlorine (0.015-0.020 per cent by chlorine ion).

Observations and biometric measurements are carried out on model plants at odd returns. Phenological observations are carried out according to the methodology of the Agricultural Crops Variety Testing Inspection. In all experiments, options were triplicated and placed consistently across tiers.

RESULTS AND DISCUSSION

Transpiration is one of the important physiological processes and is important in the study of water exchange of plants growing in saline areas. Most of the water absorbed by plants evaporates due to transpiration. Slowing down the rate of transpiration in saline conditions causes a violation of the water balance in the plant body and an increase in water deficit. As a result, the physiological and biochemical processes in the body of plants slow down and their overall productivity decreases [26-27].

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It is known that the activity of supplying water to plants is inextricably linked with the rate of transpiration. 1.5-2% of the water received by plants is absorbed by them, and the rest is evaporated through the leaves during transpiration. The value of the rate of transpiration in plants is related to many external factors. These include air temperature, relative humidity, soil and climate conditions, wind, solar radiation, soil moisture, plant development stages and cultivar characteristics, etc. [28-29].

Transpiration is not only the evaporation of water through the leaf but also water adsorption and the movement of water and dissolved substances through the plant. Zoned during research Grom, Pervitsa, Starshina, Alekseevich, Krasnodarskaya-99, Vassa, Asr and AntoninaThe transpiration rate of winter wheat varieties was studied.

It was noted that the transpiration rate of wheat varieties grown under medium-high soil salinity conditions was lower than the varieties grown under the control option. A decrease in the rate of transpiration in conditions of soil salinity may also be related to the condition of the stomata.

According to the obtained data, it was noted that the transpiration was accelerated in Grom, Starshina, and Krasnodarskaya-99 varieties of wheat. It was found that metabolism is related to activity and wheat variety characteristics. An increase in the value of this indicator was observed in the salted variants from the tuber to the milk ripening stage of all varieties.

According to the data, it was found that there is an organic relationship between transpiration and soil salinity. This connection, in turn, ensures the entry of water into the root system. Soil salinity led to a decrease in the rate of transpiration. Also, the increase in air temperature accelerates this process. The transpiration rate of wheat cultivars varied during their ontogeny. Also, it was determined based on experiments that the transpiration rate depends on the amount of metabolic and bound water in the plant, as well as on the colloidal properties of the cell protoplasm.

Transpiration is one of the important physiological processes and is of great importance in the water exchange of plants. Transpiration is one of the main processes in managing the water balance of plants.

In the course of our research, the rate of transpiration of wheat varieties during tuberization, flowering and milk ripening was studied. Experiments were carried out in two variants. The first option (non-saline soil) was called the control, and the second option was the experimental option, moderately to strongly saline soils.

The rate of transpiration was determined at all stages of wheat varieties. If we pay attention to the obtained data, it was found that the rate of transpiration of all studied wheat varieties changes depending on the concentration of salts in the soil. It was found that the rate of transpiration increases from the tuber stage to the milk ripening stage in all varieties in both variants. The rate of transpiration slowed down with increasing soil salinity in all varieties. In the control variants, compared to the experimental variants, the activation of water consumption by plant leaves was found.

Starshinain the control variant of the variety110 in the tuber stage, 64 in the moderately strong salted version, in the flowering stage it was found that 116 mg of water evaporated in the control variant, 67 in the experimental variant, i.e. 67 in the medium-strong saline variant, and 70 mg in the control and 70 mg in the experimental variant during the milk ripening phase.

In the control warrant of the Pervitsa variety, 71 are in the tuber stage, in the experimental version 44 are in the flowering stage it was noted that 74 mg of water was used in the control version, 49 in the experimental version, 76 mg in the control version, and 54 mg in the experimental version during the milk ripening phase.

The transpiration rate of the Antonina variety in the tuber phase in non-saline conditions is 92.2 in the tuber phase, and 58.3 in the saline condition, and in the flowering phase was determined that 94 mg of water evaporated in the control variant, 62 in the experimental variant, 97 mg in the control, and 65 mg in the experimental variant during the milk ripening phase. Grom varietyThe rate of transpiration in non-saline conditions in the tuber phase is 107 in the tuber phase, 60 in the saline state, in the flowering phase113 mg in the control variant, 66 in the experimental variant, 116 mg in the control and 69 mg in the experimental variant evaporated during the milk ripening phase.

century, Similar relationships were observed in Alekseevich, Krasnodar-99 and Vassa varieties. But the results of water evaporation by plants are highStarshina, GromandKrasnodar-99varieties were determined.

Compared to the tuber and flowering stage, it was observed that the evaporation of water by plants was accelerated in all studied varieties during the milk ripening stage. This can be explained by the relative increase in air temperature and the increase in the plant's need for water.

CONCLUSION

It was also found that there are differences between varieties in terms of transpiration rate. The transpiration rate of the Starshina, Grom and Krasnodar-99 varieties was observed that it was significantly higher than in the Antonina, Alekseevich and Vassa varieties. The lowest results for this indicator were found in Pervitsa and Asr varieties.

Most importantly, soil salinity had a strong negative effect on the water exchange of varieties, leading to a decrease in the rate of transpiration. Even under such circumstancesStarshina, Grom and Krasnodar-99varieties evaporated more water than other varieties and activated their metabolic processes compared to other varieties.

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